obscure, that it seems well to restrict the use of the word metabolism to these changes.

Later, in discussing the way in which enzymes act, the same example in inorganic chemistry is given again as an illustration to show how bodies may be continually altered chemically and continuously re-formed immediately, so as to appear to remain unchanged. This illustrates very well the way enzymes probably act, but does not explain metabolism.

In summarizing the discussion of living and lifeless substance it is stated (p. 136): "We may thus give expression to the problem of all physiology—*the life-process consists in the metabolism of proteids.*" It is true the possession of the proteid molecule is a definite distinction of organisms, but the *life-process* involves not only the changes in these proteids, but also the oxidation of other organic substances (fats and carbohydrates as well as handling the inorganic bodies in these processes). It is true, as is pointed out later in dealing with the mechanism of life, that the changes occurring in proteids are much more complex than the changes occurring in other organic bodies, and cannot be simulated outside the body; but the process of life includes the *entire metabolic process*, and not merely the metabolism of proteids.

The book is splendidly written, and presents so many suggestions, with a thorough discussion of vital problems treated in such a masterly way, that it is a pleasure to read a work of its kind in these days of specialism. Such a collection of facts treated in a broad and scientific way should cause the book to be read by everyone at all interested in the science of life.

The text is very fully illustrated by beautiful plates. The work of translating and editing has been most admirably performed.

W. S. C.

TREATISE ON HUMAN PHYSIOLOGY. BY HENRY C. CHAPMAN, M.D. Second edition. Philadelphia and New York: Lea Brothers & Co., 1899.

THE general plan of this work is the same as in the first edition, the author stating in his preface that, aside from the plan, the book has been recast. A very striking and disappointing feature of the work is the absence of separate chapters on metabolism and secretions—particularly internal secretions External secretions are rather briefly treated—saliva with digestion, milk with the skin, and so on. The arrangement of giving the nervous mechanism of different functions only with the nervous system seems undesirable. As an example, the nervous mechanism of the secretion of saliva is given in the last part of the book with the cranial nerves, while no reference is made under the secretion of saliva, early in the book, to those pages. The nervous mechanism of the circulation and of respiration is likewise given with the cranial nerves. Naturally, when these subjects are fully treated in one place there must be some repetition in treating of the nervous system, but this is better than dividing the subject as in the work before us, where the student would largely lose the connection. As an example, the circulation is treated of in three different places, the nervous mechanism of the heart being given with the cranial nerves, that of the bloodvessels with the sympathetic system. As a result, the depressor nerve is disposed of before the vasomotor control of the bloodvessels has been discussed. The effect of asphyxia on the circulation is only mentioned in the chapter on Respiration. It seems a distinct disadvantage to the student to be obliged to hunt up a subject in so many different places instead of having it all presented together, even if there should be some repetition.

Regarding internal secretions, they are very meagrely treated and are scattered throughout the book—that of the liver and pancreas being given under the subject of digestion; that of the thyroid, suprarenal, and thymus with the blood; while the pituitary is considered with the nervous system. We fail to see why the thyroid or suprarenal gland should be considered with the blood, or why the internal secretion of the pancreas should be considered with the digestion, as it is so separate and distinct from the external secretion, and has to do with metabolism and not with digestion.

Concerning the internal secretion of the thyroid gland, it is stated (p. 198) that the material elaborated by the gland passing into the blood promotes the general nutrition, possibly by increasing the number of red blood-corpuscles, or by destroying some toxic substance which otherwise accumulates and causes auto-intoxication. Certainly the removal of the thyroids in dogs, causing death in a short time, does not disturb the red blood-corpuscles.

The suprarenal capsules are disposed of in half a page. It is stated (p. 197) that these glands resemble in many respects, in their intimate structure, lymphatic glands. While they do contain many lymphoid cells, yet the sharp distinction between the cortex and medulla, the many different kinds of cells in the adrenals, and the peculiar arrangement of the bloodvessels, all serve to make a sharp distinction.

To say the internal secretion of the pancreas contains a glycolytic ferment which causes splitting up of sugar before it is oxidized in the tissues is an easy way of disposing of the matter, but it does not explain pancreatic diabetes, for it has been found that the blood of dogs, after extirpation of the pancreas, still has as great a glycolytic action as before.

The handling of glycogen and the formation of urea by the liver are dealt with in the chapter on Digestion even before absorption has been considered. Neither the quantity of sugar nor of urea in the blood is mentioned. The subject does not receive the attention it should, being crowded in four pages, while it should be treated in a separate chapter on metabolism.

In the chapter on Digestion no mention is made of the way in which bile aids the action of trypsin and amylopsin. . . . Concerning the digestion of starches, this is traced to the maltose stage, but the last step (the inversion of maltose into dextrose) is not made clear. No mention is made of the enzyme *invertin* at all; indeed, doubt is expressed (pp. 132 and 133) as to whether the intestinal juice has any digestive properties whatever.

Absorption would appear from this book to be solely due to physical forces, as any vital activity of the intestinal epithelium in bringing about absorption is not mentioned. The author does not explain how fats are absorbed, nor does he explain why non-dialyzable colloids can be absorbed from the intestine, while many highly dialyzable crystalloids are not absorbed.

The action of the intestinal epithelium in converting peptones into the coagulable proteids of the blood is mentioned, but no mention is made of the conversion of different forms of fats into neutral fats.

In the chapter on Blood very slight mention of the normal variation of the white blood-cells is given. No mention is made of leucocytosis, nor is any idea given of the normal number of the different varieties of leucocytes. This matter is treated as follows: "It should be mentioned that many histologists consider leucocytes as being of three kinds, differing from each other in the manner in which they (what?) stain with acid, basic or neutral dyes, or according to the number of nuclei they contain or the amount of amœboid movements they exhibit. It is very probable, however, that the three different kinds, so-called, are only different stages of development of one kind of white corpuscle" (p. 192).

Concerning the fate of the leucocytes, it is stated that "much might be said in favor of the view that white blood-corpuscles become transformed into red corpuscles, and many facts of comparative anatomy, embryology, and pathology apparently support it. It must be admitted, however, that we do not yet know whether they are transformed to another kind of corpuscle or simply disintegrate."

The blood-plates are regarded as the nuclei of disintegrated leucocytes (p. 200).

In tracing the pathway of sensory impulses through the cord it is stated (p. 571) that fibres of the posterior roots cross the middle line of the cord, and then ascend in the anterior and antero-lateral columns, so that a hemisection of the cord in a dog causes loss of sensibility on the opposite side of the body and loss of motion on the same side. This loss of sensation is certainly not the case in the dog and cat, although in man there seems to be a greater disturbance of sensation on the side opposite to the lesion. There are so many possible routes by which afferent impulses can travel up the cord that animal experimentation teaches very little. These are not made clear, however. It is stated that sections of the columns of Goll in animals is followed by defects of co-ordination similar to that due to the loss of the cerebellum. Perhaps this was not intended to include quadrupeds. Too little space, considering the size of the book, is given to the consideration of the cerebral cortex. The relation which the motor centres of the Rolandic area bear to the lower nerve-centres in the lower animals is not made clear. The remarkable recovery which the dog makes after removal of these centres is not mentioned.

Throughout the entire book a great deal of space is taken with anatomical considerations. W. S. C.

A Manual of Venereal Diseases. By James R. Hayden, M.D., Chief of Clinic and Instructor in Venereal and Genito-Urinary Diseases at the College of Physicians and Surgeons, etc. New York and Philadelphia: Lea Brothers & Co., 1898.

We gladly welcome the second edition of Dr. Hayden's little work. It is somewhat enlarged as compared with the first edition, most of the additional material appearing in the chapter devoted to stricture of the urethra.

The first half of the book is devoted to gonorrhœa, acute and chronic, and its complications, including stricture of the urethra. We